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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,934	12/12/2001	Robert J. Small	M-11675 US	1435

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT PAPER NUMBER

1765

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/017,934

Applicant(s)

SMALL ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-31 and 33-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-31 and 33-41 is/are rejected.
- 7) ☒ Claim(s) 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 24, 29-31, 33, 35, 37, and 41 are objected to because of the following informalities: the phrase, "selected from a group" should read --selected from the group--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 24, 30, 31, 35, 40, and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Small et al. (US 5,981,454).

Small teaches a composition for chemical mechanical polishing of a copper surface with an aqueous composition having a pH between and 3.5 and 7 and containing a monofunctional, difunctional or trifunctional organic acid and a buffering amount of a quarternary amine, ammonium hydroxide, hydroxylamine, hydroxylamine salt, hydrazine or hydrazine salt base (Abstract, column 2, lines 41-45 and column 7, lines 35-38), which reads on,

A composition for chemical mechanical planarization composition comprises hydroxylamine and a material selected from a group consisting of hydroxylamine nitrate and hydroxylamine sulfate (column 2, lines 41-45 and column 7, lines 35-38)., Since

Small's composition comprises the same components as applicant's composition, then using Small's composition in the same manner as the claimed invention would inherently result in hydroxylamine in an amount sufficient for chemical etching, **in claims 24, 31, and 41.**

The above further reads on, wherein the free radical inhibitor is selected from the group consisting of hydrazine, hydrazine derivatives, hydrazine salts, hydrazid, hydrazid derivatives, and any combination thereof. Since Small's composition comprises the same components as applicant's composition, then using Small's composition in the same manner as the claimed invention would inherently result wherein the said free radical inhibitor.

The said above further reads on,

the composition comprising a material selected from the group consisting of a free radical inhibitor, an insoluble complexing agent, a soluble complexing agent, and any combination thereof, **in claim 30.**

wherein the soluble complexing agent is selected from the group consisting of citric acid, **in claim 35;** and

wherein a pH of the composition is in a range of from approximately 2.0 to approximately 5.0, **in claim 40.**

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 25-28 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Small (US '454) as applied to claim 24 above, and further in view of Fang et al (US 6,347, 978 B1).

Small differs in failing to specify the amount of hydroxylamine is from approximately 0.3 to approximately 10 percent by weight **in claim 25**, hydroxylamine nitrate is from approximately 0.1 to approximately 3 percent by weight **in claim 26**, hydroxylamine sulfate in an amount from approximately 0.001 to approximately 12 percent by weight **in claim 27**, and the each of the said amounts **in claim 28**;

Small also differs in failing to teach the composition comprises an abrasive **in claim 36**; and failing to specify the type of abrasive as recited **in claims 37-39**.

Fang teaches using a polishing composition with specific additives including colloidal silica and hydroxylamine additive and (Abstract and column 2, lines 53-57),

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one or more hydroxylamine additive may be present in a chemical mechanical polishing composition in an amount ranging from about 0.01 to about 25.0 weight percent (column 3, lines 29-35), and the term hydroxylamine refers to hydroxylamine (NH_2OH), derivatives of hydroxylamine, and hydroxylamine salts including, for example, nitrate salts, sulfate salts, phosphate salts and mixtures thereof (column 3, lines 14-19). Fang also evaluated the polishing compositions using various abrasives such as silica and alumina (column 6, lines 7-19 and TABLE 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Small's polishing composition by incorporating the concentrations of hydroxylamine compounds and abrasives as taught by Fang for the purpose of producing a polishing composition having good removal rate (column 6, lines 48-59).

7. Claims 29, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Small (US 5,981,454) as applied to claim 24 above, and further in view of Small (WO 646).

Small ('454) differs in failing to teach the insoluble complexing agent is selected from the group consisting of benzotriazole, 6-dioxaspirol [4,4] nonane 2,7-dione, dioximes, an any combination thereof, **in claim 33**.

Small teaches, "CMP of the copper metal can be done over a wide pH range (2 to 12) . . . In acid solutions an inhibitor, i.e., benzotriazole (BTA) is usually needed to

control the isotropic etching effects from the chemistries used in the CMP process (page 5, lines 15-17),

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Small's ('454) polishing composition by employing benzotriazole, as taught by Small (WO '646) for the purpose of controlling the isotropic etching effects from the chemistries used in the CMP process (page 5, lines 15-17).

Small ('454) differs in failing to teach 2,4-pentadione dioxime, **in claim 34**.

Small (WO '646) teaches, "It is possible to add chelating agents; i.e. alkyl beta-diketones (2,4, pentanedione, etc.) . . ." (page 12, lines 27-29), which reads on said dioxime is 2,4-pentanedione dioxime.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Small's ('454) polishing composition by adding an alkyl beta-diketones such as 2,4, pentanedione, as taught by Small (WO '646) for the purpose reacting ketone-based systems with hydroxylamine products to form oxime derivatives which are good chelating agents (page 13, line 1-2).

Allowable Subject Matter

8. Claim 32 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: No prior, taken either alone or in combination, discloses or renders obvious a

chemical mechanical planarization composition, comprising: 4-hydrazine benzoic acid, in combination with the limitations of base claim 24.

Response to Arguments

10. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Itue

April 16, 2004

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER

